

## Exercise 1: Running containers

### 1. Pulling an Image

```
PS C:\Users\whatanicedayiana> docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
PS C:\Users\whatanicedayiana> docker search ubuntu				
NAME	DESCRIPTION	STARS	OFFICIAL	AUTOMATED
ubuntu	Ubuntu is a Debian-based Linux operating sys...	12367	[OK]	
dorowu/ubuntu-desktop-lxde-vnc	Docker image to provide HTML5 VNC interface ...	539		[OK]
websphere-liberty	WebSphere Liberty multi-architecture images ...	273	[OK]	
rastasheep/ubuntu-sshd	Dockerized SSH service, built on top of offi...	253		[OK]
consol/ubuntu-xfce-vnc	Ubuntu container with "headless" VNC session...	241		[OK]
ubuntu-upstart	Upstart is an event-based replacement for th...	110	[OK]	
ansible/ubuntu14.04-ansible	Ubuntu 14.04 LTS with ansible	98		[OK]
landinternet/ubuntu-16-nginx-php-phpmyadmin-mysql-5	ubuntu-16-nginx-php-phpmyadmin-mysql-5	50		[OK]
open-liberty	Open Liberty multi-architecture images based...	46	[OK]	
ubuntu-debootstrap	debootstrap --variant=minbase --components=m...	44	[OK]	
i386/ubuntu	Ubuntu is a Debian-based Linux operating sys...	25		
solita/ubuntu-systemd	Ubuntu + systemd	24		[OK]
nuagebec/ubuntu	Simple always updated Ubuntu docker images w...	24		[OK]
landinternet/ubuntu-16-apache-php-5.6	ubuntu-16-apache-php-5.6	14		[OK]
landinternet/ubuntu-16-apache-php-7.0	ubuntu-16-apache-php-7.0	13		[OK]
landinternet/ubuntu-16-nginx-php-phpmyadmin-mariadb-10	ubuntu-16-nginx-php-phpmyadmin-mariadb-10	11		[OK]
landinternet/ubuntu-16-nginx-php-5.6-wordpress-4	ubuntu-16-nginx-php-5.6-wordpress-4	9		[OK]
landinternet/ubuntu-16-nginx-php-5.6	ubuntu-16-nginx-php-5.6	8		[OK]
landinternet/ubuntu-16-apache-php-7.1	ubuntu-16-apache-php-7.1	7		[OK]
pivotaldata/ubuntu	A quick freshening-up of the base Ubuntu doc...	4		
landinternet/ubuntu-16-nginx-php-7.0	ubuntu-16-nginx-php-7.0	4		[OK]
pivotaldata/ubuntu-gpdb-dev	Ubuntu images for GPDB development	1		
smartentry/ubuntu	ubuntu with smartentry	1		[OK]
landinternet/ubuntu-16-php-7.1	ubuntu-16-php-7.1	1		[OK]
landinternet/ubuntu-16-rspec	ubuntu-16-rspec	0		[OK]

Fig. 1. Viewing and searching images

```
PS C:\Users\whatanicedayiana> docker pull ubuntu:16.04
16.04: Pulling from library/ubuntu
80bce60046fa: Pull complete
55a738a15540: Pull complete
e19cf0706c62: Pull complete
de4cdd6c27d1: Pull complete
Digest: sha256:9775877f420d453ef790e6832d77630a49b32a92b7bedf330adf4d8669f6600e
Status: Downloaded newer image for ubuntu:16.04
docker.io/library/ubuntu:16.04
PS C:\Users\whatanicedayiana> docker pull ubuntu:16.10
16.10: Pulling from library/ubuntu
dca7be20e546: Pull complete
40bca54f5968: Pull complete
61464f23390e: Pull complete
d99f0bcd5dc8: Pull complete
120db6f90955: Pull complete
Digest: sha256:8dc9652808dc091400d7d5983949043a9f9c7132b15c14814275d25f94bca18a
Status: Downloaded newer image for ubuntu:16.10
docker.io/library/ubuntu:16.10
PS C:\Users\whatanicedayiana> docker images
```

REPOSITORY	TAG	IMAGE ID	CREATED	SIZE
ubuntu	16.04	9ff95a467e45	3 weeks ago	135MB
ubuntu	16.10	7d3f705d307c	3 years ago	107MB

Fig. 2. Pulling different versions of same image, and viewing the said image collections

```
PS C:\Users\whatanicedayiana> docker rmi ubuntu:16.10
Untagged: ubuntu:16.10
Untagged: ubuntu@sha256:8dc9652808dc091400d7d5983949043a9f9c7132b15c14814275d25f94bca18a
Deleted: sha256:7d3f705d307c7c225398e04d4c4f8512f64eb8a65959a1fb4514dfde18a047e7
Deleted: sha256:d9db289b9342d9617596cd6ee3bba988629e24d9afa5db4e4b0e4e491c65007d
Deleted: sha256:a87725e8597b97f2399bc3aa50b0e2eec903b8ce19055668d3befb012918205c
Deleted: sha256:38cf10a2801529348366953e9b933d3524360dedc91d3e4d5d7f941da0c973c9
Deleted: sha256:61172966249d43026dbd017eec3a9575e37bddf8a269a9f09ecb559d7bfe7fef
Deleted: sha256:57145c01eb80040fdd0a24cde20af4788605b49593188d4f7efab099af89a08e
PS C:\Users\whatanicedayiana> docker images
REPOSITORY    TAG        IMAGE ID      CREATED      SIZE
ubuntu        16.04      9ff95a467e45  3 weeks ago  135MB
```

Fig. 3. Deleting image using tag

## 2. Running container

```
PS C:\Users\whatanicedayiana> docker run ubuntu:16.04 /bin/echo 'Hello world!'
Hello world!
```

Fig. 4. Run simple application that prints “Hello world!” (using Ubuntu 16.04 image)

```
PS C:\Users\whatanicedayiana> docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED    STATUS    PORTS    NAMES
PS C:\Users\whatanicedayiana> docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED    STATUS    PORTS    NAMES
b9f12ee1ce84   ubuntu:16.04   "/bin/echo 'Hello wo..."  About a minute ago    Exited (0) About a minute ago    hungry_mcclintock
```

Fig. 5. View containers that ran (container’s status is exited)

```
PS C:\Users\whatanicedayiana> docker run ubuntu:16.04 /bin/bash
PS C:\Users\whatanicedayiana> docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED    STATUS    PORTS    NAMES
c632bfc7b07d   ubuntu:16.04   "/bin/bash"             8 seconds ago    Exited (0) 7 seconds ago    eager_gagarin
b9f12ee1ce84   ubuntu:16.04   "/bin/echo 'Hello wo..." 4 minutes ago    Exited (0) 4 minutes ago    hungry_mcclintock
PS C:\Users\whatanicedayiana> docker run -it ubuntu:16.04 /bin/bash
root@40dcba3f32e92:/# pwd
/
root@40dcba3f32e92:/# ls
bin boot dev etc home lib lib64 media mnt opt proc root run sbin srv sys tmp usr var
root@40dcba3f32e92:/# exit
exit
PS C:\Users\whatanicedayiana> docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED    STATUS    PORTS    NAMES
40dcba3f32e92   ubuntu:16.04   "/bin/bash"             About a minute ago    Exited (0) 37 seconds ago    interesting_sanderso
c632bfc7b07d   ubuntu:16.04   "/bin/bash"             2 minutes ago    Exited (0) 2 minutes ago    eager_gagarin
b9f12ee1ce84   ubuntu:16.04   "/bin/echo 'Hello wo..." 6 minutes ago    Exited (0) 6 minutes ago    hungry_mcclintock
```

Fig. 6. Running an interactive program with a *docker run* command that doesn’t run interactively by default vs. with a *docker run -it* command that allows to run the command interactively

```
PS C:\Users\whatanicedayiana> docker run -d ubuntu:16.04 /bin/sleep 3600
e1976f6367e60394927ffb25978675d44ed62af200004bb096418aa873aec34e
PS C:\Users\whatanicedayiana> docker ps
CONTAINER ID   IMAGE      COMMAND                  CREATED    STATUS    PORTS    NAMES
e1976f6367e6   ubuntu:16.04   "/bin/sleep 3600"        8 seconds ago    Up 6 seconds    determined_mcclintock
```

Fig. 7. Running in detached mode (container will continue to run as long as the command is, but it won’t print the output)

```
PS C:\Users\whatanicedayiana> docker exec -it e19 /bin/bash
root@e1976f6367e6:/# ps aux
USER      PID %CPU %MEM    VSZ   RSS TTY      STAT START   TIME COMMAND
root         1  0.0  0.0   4372   644 ?        Ss   19:53   0:00 /bin/sleep 3600
root         7  0.0  0.0   18232  3192 pts/0    Ss   19:55   0:00 /bin/bash
root        17  0.0  0.0   34420  2856 pts/0    R+   19:56   0:00 ps aux
root@e1976f6367e6:/# exit
exit
PS C:\Users\whatanicedayiana> docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
e1976f6367e6   ubuntu:16.04  "/bin/sleep 3600"       2 minutes ago  Up 2 minutes          determined_mcclintock
PS C:\Users\whatanicedayiana> docker stop e19
e19
PS C:\Users\whatanicedayiana> docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
e1976f6367e6   ubuntu:16.04  "/bin/sleep 3600"       3 minutes ago  Exited (137) 27 seconds ago  determined_mcclintock
40dcba32e92    ubuntu:16.04  "/bin/bash"             6 minutes ago  Exited (0) 6 minutes ago  interesting_sanderson
c632bfc7b07d   ubuntu:16.04  "/bin/bash"             8 minutes ago  Exited (0) 8 minutes ago  eager_gagarin
b9f12ee1ce84   ubuntu:16.04  "/bin/echo 'Hello wo..." 12 minutes ago  Exited (0) 12 minutes ago  hungry_mcclintock
```

Fig. 8. Running something in container, and stopping/exiting the container

### 3. Removing Containers

```
PS C:\Users\whatanicedayiana> docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
e1976f6367e6   ubuntu:16.04  "/bin/sleep 3600"       8 minutes ago  Exited (137) 5 minutes ago  determined_mcclintock
40dcba32e92    ubuntu:16.04  "/bin/bash"             12 minutes ago  Exited (0) 11 minutes ago  interesting_sanderson
c632bfc7b07d   ubuntu:16.04  "/bin/bash"             13 minutes ago  Exited (0) 13 minutes ago  eager_gagarin
b9f12ee1ce84   ubuntu:16.04  "/bin/echo 'Hello wo..." 17 minutes ago  Exited (0) 17 minutes ago  hungry_mcclintock
PS C:\Users\whatanicedayiana> docker rm b9f
b9f
PS C:\Users\whatanicedayiana> docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
e1976f6367e6   ubuntu:16.04  "/bin/sleep 3600"       9 minutes ago  Exited (137) 6 minutes ago  determined_mcclintock
40dcba32e92    ubuntu:16.04  "/bin/bash"             13 minutes ago  Exited (0) 12 minutes ago  interesting_sanderson
c632bfc7b07d   ubuntu:16.04  "/bin/bash"             15 minutes ago  Exited (0) 14 minutes ago  eager_gagarin
PS C:\Users\whatanicedayiana> docker run --rm ubuntu:16.04 /bin/echo 'Hello and goodbye'
Hello and goodbye
PS C:\Users\whatanicedayiana> docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
e1976f6367e6   ubuntu:16.04  "/bin/sleep 3600"       10 minutes ago  Exited (137) 7 minutes ago  determined_mcclintock
40dcba32e92    ubuntu:16.04  "/bin/bash"             13 minutes ago  Exited (0) 13 minutes ago  interesting_sanderson
c632bfc7b07d   ubuntu:16.04  "/bin/bash"             15 minutes ago  Exited (0) 15 minutes ago  eager_gagarin
PS C:\Users\whatanicedayiana> docker rm $(docker ps -a -q)
e1976f6367e6
40dcba32e92
c632bfc7b07d
PS C:\Users\whatanicedayiana> docker ps -a
CONTAINER ID   IMAGE     COMMAND                  CREATED        STATUS        PORTS   NAMES
```

Fig. 9. Removing a container after it exits, removing a container by its partial ID and removing all containers in the system